SFOMC Data Management/Interactive Web

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LONG-TERM GOAL

The general objective is to establish an oceanographic data repository and make that data publicly accessible through interactive websites.

OBJECTIVES

The objectives of the proposed work are to create: a web based geographical information system (GIS) with interactive maps of the SFOMC range, implement a web based data archival and retrieval system, create a web based real time environmental data display, and create a web based interactive ambient noise pretest decision aid capability.

APPROACH

The GIS webserver utilizes the Internet Map Server (IMS) software from ESRI corporation. It is a graphical, chart based visual representation of SFOMC assets and data sets. The map server depicts local offshore bathymetry in both graduated contours and high resolution images. The map server also shows the locations of offshore sensors, experiment locations, mooring locations, and restricted anchorage zones in relation to land.

The data archival and retrieval webserver utilizes the Distributed Oceanographic Data Server (DODS) model where the data is in text format and is readily shared through data file downloading. The DODS webserver data is searchable by experiment name, time, location, depth, and sensor type. The Data Archive system consists of redundant data storage on mutiple formats. First the principal investigators keep the original data. Second the data is warehoused at the South Florida Testing Facility on CD-ROMS. Thirdly, the data is kept on a data storage hard drive on a secure government computer behind a firewall. And finally the data is placed on the offsite publicly accessible webservers and finally, the webservers are backed up onto additional data storage hard drives.

The real time webserver graphically presents environmental and oceanographic data from both onshore and offshore sensors. The environmental data consists of wind magnitude and direction, air temperture, relative humidity, and rainfall amounts. The oceanographic data includes current magnitude and direction at varying depths, and wave height.

The web based ambient noise webserver utilizes a Matlab engine that graphically presents offshore ambient acoustic data. The data is presented in three formats including; one third octave band (OTO),

narrow band (NB), and OTO cumulative probability of occurence plots. The acoustical data is searchable by date, time and depth.

The publicly accessible webservers are kept offsite at the Naval Surface Warfare Center Headquarters in Bethesda, MD. The websites are remotely administered and maintained by the South Florida Testing Facility.

WORK COMPLETED

The DODS web server is complete and fully functional. The work breakdown included website design, oceanographic data acquisition, oceanographic data processing for internet viewing, obtaining official DOD clearance for public access to the web server, establishing the web server in an offsite location, and publishing the website to the internet. The website is viewable at: http://sftfdods.dt.navy.mil/ Ongoing efforts include capturing past data sets and adding more data as it is acquired and catalogued.

The Internet Map Server is complete and nearly functional. The work breakdown included website design, geographical data acquisition, geographical data processing for Internet viewing, and uploading geographical data to web server. An official DOD clearance for public access has been received and the web server is being sent to an offsite location for publishing to the Internet.

The Matlab web server is complete and nearly functional. The work breakdown included website design, acoustic data acquisition, acoustic data processing for Internet viewing, and uploading acoustic data to web server. An official DOD clearance for public access has been applied for and upon receipt, the web server will be sent to an offsite location for publishing to the Internet.

The real time environmental data website http://sftf.dt.navy.mil was fully functional until just recently. The NT4 web server ran successfully since 1995 and fell victim to the latest rounds of Internet attacks and has been taken offline for repairs and operating system upgrades. During this time, we will modernize and update the graphical interface for the website, and add additional features, as well as upgrading security.

IMPACT/APPLICATIONS

This project is aiding the scientific community and benefiting the local community through exploration of local geographical, environmental, and oceanographic data and information sharing. It will also serve to increase the awareness of projects underway at the South Florida Ocean Measurement Center. Applications of societal relevance include safe navigation, search and rescue operations, beach erosion forcing function measurement, monitoring of transport mechanisms for pollution from sewage plants, harmful algal blooms, and hazardous material tracking.

Applications to government projects other than ONR projects include application to remote observing ground truth capability. This is evidenced by real time environmental support of the Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX) Compact Hydrographic Airborne Rapid Total Survey (CHARTS) acceptance testing. The JALBTCX is based out of the US Army Engineer District, Mobile and combines it's extensive operational capabilities with the international hydrographic and nautical charting capabilities of the U.S. Naval Meteorology and Oceanography Command and the Naval Oceanographic Office, and with the research and development (R&D)

expertise of the US Army Engineer Research and Development Center (ERDC). Use of real time environmental data and existing high resolution SFOMC bathymetry in GIS format contributed to the success of the CHARTS acceptance testing. Applications to other ONR projects include direct support for GIS archiving and oceanographic measurement and archiving of data for the planned Acoustic Observatory (AO).

Of particular impact is the synergy being created at SFOMC by multiple users and the legacy of data each project leaves that is useful to the next project. An example of this is the ONR sponsored UM acoustic array. The acoustic data acquired from this array and NAVO supplied bathymetric data taken to support this experiment was eventually mined to support choosing SFOMC in the AO site selection process. Similarly the ONR sponsored SFOMC optical tracking systems and AO radar tracking systems have been used successfully to support the SPAWAR installation of the DADS and the ranging of a diesel electric Peruvian submarine.

RELATED PROJECTS

All SFOMC data collection efforts are related to this project as it represents the repository and portal for these data collection efforts. The work itself is directly related to becoming a node on the National Integrated Ocean Observing System (IOOS). The DODS server was chosen to meet the entry level requirements of data arcival and storage for IOOS.